

came before him in which the patents had been taken out in Germany and brought over here to be developed and worked at a profit. Why was this? While Germany has founded numerous places for chemical experiment and research, nothing of the kind is provided here, except at such colleges and schools as those belonging to the City and Guilds of London Institute. It is a matter of national concern that whatever is possible should be done to give a stimulus to the scientific and industrial activity of the country.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Society of Chemical Industry** (London Section), February 5.—Mr. R. J. Friswell in the chair.—Carburetted water gas in the Bunsen burner: M. **Chikashigé**. Carburetted water gas is now prepared in the Kyoto University by injecting heavy petroleum oil with steam into a water-gas generator filled with ignited coke. The gas produced is passed through a superheater loosely packed with fire-bricks, and then through a scrubber, after which treatment it enters the gas holders. The mean composition of the gas differs little from that of coal gas, and the products of combustion closely resemble those of coal gas. The carburetted gas has no effect on the ordinary laboratory vessels, and the products of combustion, unlike those of plain water gas, are not more injurious in insufficiently ventilated laboratories than those of coal gas.—The loss of nitre in the chamber process, part ii.: J. K. H. **Inglis**. The loss of nitre, which usually amounts to about 3 per cent. of the sulphur burnt, can best be traced by complete analyses of the flue gases. The analysis cannot be carried out by means of aqueous absorbents owing to the formation of complicated bodies by the interaction of nitrous acid and sulphur dioxide. But the analysis may be conveniently made by the fractional distillation of the gases, first at the temperature of liquid air and subsequently at higher temperatures. The results showed that only about 4 per cent. of the lost nitre was lost as nitrous oxide and 43 per cent. as nitrogen peroxide. In the first experiments the temperature of liquid air was insufficient to effect the separation of nitric oxide from the flue gases owing to the vapour pressure of nitric oxide. Some further experiments were therefore made at a lower temperature obtained by making liquid air boil under diminished pressure. The amount of nitrogen oxides found was no greater than in the earlier experiments, and this might therefore mean that nitric oxide is not present in the flue gases.—The removal of nitrous acid from concentrated nitric and sulphuric acid: O. **Silberrad** and B. J. **Smart**. The experiments were made to determine to what extent the reaction between nitrous acid and amines or amides occurs in concentrated acids. Nitric acid containing a small percentage of nitrous acid was taken either alone or in admixture with sulphuric acid. The addition of hydrazine occasions an explosion, and with this exception substances such as urea, lead peroxide, oxamide, methylamine nitrate, and amido guanidine are very inert towards nitrous acid in presence of concentrated nitric acid, although they react readily in dilute solution. The observation of Franchimont that urea nitrate decomposes with evolution of carbon dioxide and nitrous oxide was confirmed.

**Zoological Society**, February 6.—Mr. G. A. Boulenger, F.R.S., vice-president, in the chair.—Mounted cubs of the timber-wolf (*Canis occidentalis*), obtained in the province of Keewatin, Canada: F. **Gillett**.—Restored models of the skulls and mandibles of *Mœrittherium* and *Palæomastodon*: Dr. C. W. **Andrews**. The models were prepared by Mr. F. O. Barlow from the original specimens collected from the Upper and Middle Eocene beds of the Fayûm, Egypt, and now preserved in the British Museum and the Geological Museum, Cairo.—Lantern-slides of sections of skin from the palmar and plantar surfaces of twenty-four species of mammals, and the plantar surfaces of seven species of birds: Dr. W. **Kidd**. The functions of the papillary ridges and the papillary layer of the corium in connection with the sense of touch were alluded to.—Histology and physiology of the placenta in the Ungulata: Dr. J. W. **Jenkinson**. A recent examination

of the histological structure of the placenta in the sheep and cow has shown (1) that in the formation of the accessory cotyledons of the cow the epithelium lining the cotyledonary crypts arises by simple modification of the uterine epithelium; (2) that in the fully formed principal cotyledons of both cow and sheep there is complete continuity of the intra- with the extra-cotyledonary uterine epithelium; (3) that the greenish-brown pigment so abundantly present in the trophoblast-cells is a derivative of the hæmoglobin of the maternal corpuscles which those cells have ingested. The pigment—which contains no iron—is of two kinds, one of which has a definite absorption spectrum resembling closely that of oxyhæmoglobin. In acid solution the spectrum approaches that of acid hæmatoporphyrin.—A living specimen of a dwarf species of cavy, probably the salt-marsh cavy (*Dolichotis salinicola*): Sir Edmund **Loder**, Bart. Owing to Burmeister (the original describer of the animal) being under the erroneous impression that he had founded the species on young specimens and the fact that two distinct species occurred in the same district, some considerable confusion had been caused as to the status of the different forms of *Dolichotis*. The author pointed out that the common Patagonian cavy (*D. patagonicus*) differed from the dwarf *D. salinicola* and the larger *D. magellanicus centricola* (the two species found together) in having a broad dark band above the white rump-patch.—A description of *Trichorhiza*, a new hydroid genus: E. S. **Russell**.—Description of the new genus *Melissomorpha*, formed for the reception of a horse-fly of the Pangoninæ division of the family Tabanidæ, discovered by Colonel C. T. Bingham in Sikkim: Gertrude **Ricardo**. The insect closely mimicked the Indian bee *Apis dorsata*, L., having the flattened wide tibiae characteristic of the hive-bee, the general resemblance between the bee and the fly being very striking.—Mammals collected at Kuruman and Molopo in Bechuanaland by Messrs. R. B. Woosnam and R. E. Dent: H. **Schwann**. The specimens, numbering about 120, and belonging to 26 species, were of great interest as being topotypes of several species described by Sir Andrew Smith in his expedition to Kuruman and the interior of South Africa.—Description of a new species of ratel (*Mellivora*) from Central Africa, also notice of the occurrence of a new subspecies of chevrotain (*Dorcatherium*) in that district: R. **Lydekker**. The author proposed to divide the genus into three geographical races, viz. the typical form from the Gambia, Bates's chevrotain from the Cameroons, and the present—Cotton's chevrotain—from the Ituri Forest.—The articulation of the vertebrate jaw: H. G. F. **Spurrell**. The object of this paper is to direct attention to the existence of two types of mouth in vertebrates. In one type the articulation is in the plane in which the teeth meet; in the other type it is not in the plane in which the teeth meet, but in mammals above, in reptiles below that level. This alteration in level is attained in mammals by an ascending ramus of the jaw, in reptiles by a long quadrate bone.

**Entomological Society**, February 7.—Mr. F. Merrifield, president, in the chair.—*Exhibitions*.—Specimen of *Lathrobium laevipenne*, Heer, a beetle new to the British list, taken in a sandpit near Oxted, Surrey, in August, 1905: W. E. **Sharp**.—Specimens of South African butterflies belonging to the Nymphaliniæ, Acraeiniæ, Danainæ, and Papilioniniæ: Dr. F. A. **Dixey**. Attention was directed to the significance of the fact that scents of an agreeable nature (as in Pieriniæ generally, *Mycæstis safitza*, &c.) were as a rule confined to the male sex, while those of a disagreeable or disgusting character (as in Acraeiniæ and many Papilioes) were often common to both sexes.—Four species of Acraea taken in South Africa during the visit of the British Association: Dr. G. B. **Longstaff**. The species were (1) *A. anemosa*, Hew., from the Victoria Falls, and Mochudi, in Bechuanaland; (2) *A. alboradiata*, Auriv., previously known to Mr. Roland Trimen by two females only, and considered by him as a variety of *anemosa*; (3) *A. atolmis*, Westw., to which Westwood gave the names of *atolmis* and *acontias*, although there seems no doubt they are one species; (4) *A. atergatis*, Westw., the two types of which are in the Hope collection at Oxford.—Two Diptera, which had been observed follow-

ing the bee, *Andrena labialis*, Kirb., by Mr. A. H. Hamm, identified by Mr. G. H. Verrall as a species of *Chortophila*: Prof. E. B. Poulton. Prof. Poulton stated that new and interesting light had been thrown on the observation by Colonel Yerbury, who pointed out that both flies were males. At first sight it seemed astonishing that the bees should be pursued by the males of inguiline flies, but he suggested that the males in this way find their way to the burrows, where they meet the females, which have also reached them in the same manner, or where, more probably, they lie in wait for the freshly emerging females.—Collection of Rhopalocera made in Spain during July and August, 1905: W. G. Sheldon. There were also shown for comparison typical European specimens; an aberration of *A. aglaia*, with the black blotches on the superiors enlarged and banded, and with dark suffused ground colour on all wings; and an interesting series of *L. corydon* and var. *hispana*, with forms approaching var. *polonus*, from Aragon, and intermediates between all these forms, and also British, French, and Swiss typical specimens for comparison.—*Papers*.—(1) Some rest attitudes of butterflies; (2) some bionomic points in certain South African Lamellidors: Dr. G. B. Longstaff.—Some new or hitherto unfigured species of South African butterflies: Roland Trimen.—Some observations on the reproduction of Hemiptera-Cryptocera by Claydon Hewett: Commander J. J. Walker.

**Chemical Society**, February 15.—Prof. R. Meldola, F.R.S., president, in the chair.—Cuprous formate: A. Angel. This salt was prepared by dissolving cuprous oxide in an aqueous ammoniacal solution of ammonium formate under petroleum, diluting with alcohol, acidifying with formic acid, and washing the deposited crystals with ethyl formate. Water immediately hydrolyses it to cuprous oxide and formic acid, and dilute sulphuric acid at once produces a precipitate of metallic copper.—The solubility of triphenylmethane in organic liquids, with which it forms crystalline compounds: H. Hartley and N. G. Thomas. The results of these experiments confirm the existence of a metastable region in which supersaturated solutions cannot crystallise spontaneously.—The spontaneous crystallisation of supersaturated solutions: H. Hartley. It was shown how the difference between metastable and labile solutions might be explained from the kinetic standpoint as a result of the increased solubility of the small crystals which must be first formed in a spontaneous crystallisation.—Preparation and properties of some new tropeines: H. A. D. Jowett and A. C. O. Mann. The tropeines of methylparaconic, terebic, glycolic, protocatechuic, and phthalidecarboxylic acids were prepared. The results of physiological experiments with these confirm Ladenburg's view that for mydriatic action to exist in a tropeine the acyl group should contain a benzene nucleus and an aliphatic hydroxyl in the side-chain containing the carboxyl group.—Studies in asymmetric synthesis, iv., the application of Grignard's reaction for asymmetric syntheses: A. McKenzie. The author has studied the action of magnesium propyl iodide, magnesium isobutyl iodide, and magnesium  $\alpha$ -naphthyl bromide respectively on *l*-menthyl benzoylformate, and effected in each case an asymmetric synthesis of a substituted *l*-glycollic acid.—*o*-Cyanobenzene-sulphonic acid and its derivatives: A. J. Walker and E. Smith. The authors described a modification of Jesurun's method for the preparation of *o*-cyanobenzene-sulphonic chloride, and referred to various substances obtained from this by reduction and hydrolysis.—The condensation of dimethyldihydroresorcinol and of chloroketo-dimethyltetrahydrobenzene with primary amines, part ii., diamines, *m*- and *p*-phenylenediamines: P. Haas.—A modification of the volumetric estimation of free acid in the presence of iron salts: C. Chester Ahlum. The iron is precipitated by means of sodium dihydrogen phosphate, and the filtrate titrated with standard sodium hydroxide. In the reaction of the ferric salt with the phosphate, a definite quantity of acid, directly proportional to the amount of "ferric" iron present, is liberated, and is corrected for by estimating the "ferric" iron present before titrating. The method is applicable to natural waters containing iron salts and free acid.—The theory of alkaline development, with notes on the affinities of certain

reducing agents: S. E. Sheppard.—Resolution of 2:3-dihydro-3-methylindene-2-carboxylic acid into its optically active isomerides: A. Neville. The acid forms with *l*-menthylamine a well defined crystalline salt, which on crystallisation from ethyl acetate gives, after a few crystallisations, the pure salts of the *d*-acid and *l*-base.

## PARIS.

**Academy of Sciences**, February 19.—M. H. Poincaré in the chair.—The simultaneous determination of two points by means of graphical construction on the large scale: M. Hatt.—The boiling and distillation of nickel, iron, manganese, molybdenum, tungsten, and uranium: Henri Moissan (see p. 424).—The function of organic matter in nitrification: A. Müntz and E. Laine. The experiments of Winogradsky and Omeliansky have given rise to the idea that the presence of humic material is not only unnecessary, but even harmful to the process of nitrification. The present researches deal specially with the rôle of humus in the nitrifying process, and it was found that organic material in this form does not hinder the process, and may be favourable. Abundance of humus is not an indispensable condition for nitrification, but its presence is favourable to the multiplication of the organisms, and the nitrification ultimately becomes more rapid.—The reproduction of architectural monuments from their photographs, practised especially in Germany: M. Laussedat.—Synthesis of tertiary alcohols derived from paramethylcyclohexane: Paul Sabatier and A. Mailhe. Methylcyclohexanone (1:4) is readily obtained from paracresol by reduction in presence of reduced nickel. It reacts energetically with organomagnesium halogen compounds, and the product of the reaction treated with water gives tertiary alcohol. The alcohols arising from the action of the methyl, ethyl, propyl, isopropyl, isobutyl, isoamyl, and octyl magnesium iodides (or bromides) are described in detail, and also the substituted ethylenes arising from their dehydration. The reaction with phenyl-magnesium bromide and benzyl-magnesium chloride is also given. The optical constants were determined, and found to correspond very closely with the molecular refractive powers calculated from the coefficients of Conrady and Brühl, thus furnishing a further proof that the hexamethylene ring introduces no abnormality into the refractive constant.—The dangers of the ingestion of dead tubercle bacilli into tuberculous and healthy animals: A. Calmette and M. Breton. In the experiments described the tuberculous bacilli were sterilised by heating to 100° C. Tuberculous guinea-pigs had their death hastened by the repeated injection or ingestion of sterilised tubercle bacilli, the general effect being similar to that produced by repeated injection of tuberculin. In healthy animals the results are injurious, sometimes producing disorders resembling those produced by tuberculin. One practical conclusion to be drawn from this work is that milk from tuberculous cows, even after sterilisation by heat, is not a safe food, especially if the person taking such milk is already tuberculous.—The photographic study of the duration of discharge in a Crookes' tube: André Broca and M. Turchini. The photographs of the spark were taken from a rotating mirror, the velocity being adjusted so that a time of 0.001 second corresponded to 63 mm. on the plate. The photographs showed a sudden commencement of the discharge lasting 0.00025 second, followed by a weakening terminating asymptotically at the end of about 0.0008 second. With a soft tube the same form of discharge was observed, but the time throughout was greater. The authors regard this method as giving an upper limit for the time of discharge.—A method for measuring the total quantity of X-rays emitted in a given time: M. Gaiße.—The radio-activity of springs of potable water: F. Diénert and E. Bouquet. Measurements are given of the radio-activity of the water from the Group de Nouvet, Erigny, Rivièrre, and Breuil springs.—The condensation of the acetylenic nitriles with phenols. A general method of synthesis of  $\beta$ -substituted acrylic  $\beta$ -oxyphenol nitriles: Ch. Moureu and I. Lazennec. It has been found that the condensation between alcohols and nitriles of the type  $R-C\equiv C-CN$  also takes place when phenols are substituted for the alcohols. Details are given of seven compounds formed in this way.—Researches in the pyrene series: E. E. Blaise and H. Gault.—The presence of



formaldehyde in caramelised substances: A. **Trillat**. Quantities of formaldehyde varying from traces up to 0.27 per cent. have been found in caramel; the higher the temperature at which the caramel is formed, the higher the percentage of formaldehyde. This fact may account for the observed variation in fermentation of slightly burnt sugar.—The bryological vegetation of the Antarctic regions: Jules **Cardot**. An account of forty-six mosses collected in various Antarctic expeditions.—The sporulated yeasts of *Gloeosporium*: P. **Viala** and P. **Pacottet**.—The influence of grafting on the quality of the grape and wine, and its use in the systematic improvement of sexual hybrids: M. **Curtel** and A. **Jurie**.—The evolution of colonies of *Diplosoma spongiforme* and the "displanctomy" of the ascidoids: Antoine **Pizon**.—The male and the sucker of *Nicothoa Astaci*: A. **Quidor**.—The peat deposits of the sea shores of Brittany, to the north of Morlaix, Finistère: L. **Cayeux**.—A whirlwind of very small dimensions: M. **Luizet**.

## CALCUTTA.

**Asiatic Society of Bengal**, January 10.—Types of fever in Calcutta: Major L. **Rogers**.—Description of two new species of cyprinoid fishes from the Helmand basin: C. Tate **Regan**. Five species of fish were taken in the stream of the Helmand basin by the members of the recent Seistan Arbitration Commission. Of these, two, *Scaphiodon macmahoni* and *Nemachibus rhadinaeus*, are described as new.—The origin of mankind (according to the Lamaic mythology): Rai Sarat Chandra Das Bahadur. In the beginning of the *Kalpa*, when living beings had sprung up in the regions of the *Rirab* (*Sumeru*) mountain, situated above the residence of the four *Dika Pala* (guardians of the world called *Maharaja Kayiko*), two Devaputra (angels) came down to this earth from Heaven, being miraculously transformed into human shape. One of them was *Nima Rabnang*, and the other was *Dawa Dimeh*. These were followed by other angels, whose term of residence in Heaven had expired at the exhaustion of the merit they had acquired before. Thus humanity evolving from heavenly origin in course of time multiplied on earth.—Persian folk songs: Major D. C. **Phillott**.

## DIARY OF SOCIETIES.

## THURSDAY, MARCH 1.

ROYAL SOCIETY, at 4.30.—An Experimental Inquiry into the Factors which determine the Growth and Activity of the Mammary Glands: Miss J. E. Lane-Claydon and Prof. E. H. Starling, F.R.S.—The Specificity of the Opsonic Substances in the Blood Serum: Dr. W. Bulloch and G. T. Western.—The Internal Anatomy of Somoxys: Lieut. F. Tulloch, R.A.M.C.

CHEMICAL SOCIETY, at 8.30.—Studies of Dynamic Isomerism. Part IV. Stereoisomeric Halogen Derivatives of Camphor: T. M. Lowry.

ROYAL INSTITUTION, at 5.—The Physiology of Plants: F. Darwin, F.R.S.

LINNEAN SOCIETY, at 8.—On a New Type of Stem from the Coal-measures: Dr. D. H. Scott, F.R.S.—Notes on Some Species of Nereis in the District of the Thames Estuary: Dr. H. C. Sorby, F.R.S.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY, at 8.—Coast Lines Protected by Chain Cable Groynes: R. G. Allanson-Winn.

GEOLOGISTS' ASSOCIATION, at 8.—Note on an Ostracodal Limestone from Durlston Bay, Dorset: F. Chapman.—(1) Remarks on the Upper Chalk of Surrey: (2) The Devonian Limestones of Lummatt Hill, near Torquay: A. J. Jukes-Browne.

## FRIDAY, MARCH 2.

ROYAL INSTITUTION, at 9.—Hippocrates and the Newly Discovered Health Temple at Cos: Dr. R. Caton.

## SATURDAY, MARCH 3.

ROYAL INSTITUTION, at 3.—The Corpuscular Theory of Matter: Prof. J. J. Thomson, F.R.S.

## MONDAY, MARCH 5.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Ignition of Nitro-compound Explosives in Small Arm Cartridges: W. D. Borland.

VICTORIA INSTITUTE, at 4.30.—On the Bearing of Recent Oriental Discovery on Old Testament History: Rev. A. C. Robinson.

## TUESDAY, MARCH 6.

ROYAL INSTITUTION, at 5.—Food and Nutrition: Prof. W. Stirling.

SOCIETY OF ARTS, at 8.—Imperial Questions in the West Indies: Sir Neville Lubbock, K.C.M.G.

ZOOLOGICAL SOCIETY, at 8.30.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Continued Discussion: A Plea for Better Country Roads: G. R. Jebb.—Country Roads for Modern Traffic: J. E. Blackwell.—Probable Paper: The Widnes and Runcorn Transporter-Bridge: J. J. Webster.

## WEDNESDAY, MARCH 7.

SOCIETY OF ARTS, at 8.—Art in Painting and Photography: J. C. Dollman.

ENTOMOLOGICAL SOCIETY, at 8.—The late Prof. Packard's Paper on the Origin of Markings of Organisms: H. Eltringham.

GEOLOGICAL SOCIETY, at 8.—On the Occurrence of Limestone of the Lower Carboniferous Series in the Cannock Chase Portion of the South

Staffordshire Coalfield: G. M. Cockin.—Liassic Dentaliidae: L. Richardson.

SOCIETY OF PUBLIC ANALYSTS, at 8.

## THURSDAY, MARCH 8.

ROYAL SOCIETY, at 4.30.—Probable Papers: The Microscopic Changes in the Nervous System in a Case of Chronic Dourine or "Mal de Coit," and Comparison of the Same with Those found in Sleeping Sickness: Dr. F. W. Mott, F.R.S.—On the Relationship between Haemolysis and Phagocytosis of Red Blood Cells: Dr. R. D. Keith.

ROYAL INSTITUTION, at 5.—The Physiology of Plants: F. Darwin, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—A New Single-Phase Commutator Motor: V. A. Fynn.

MATHEMATICAL SOCIETY, at 5.30.—On Function Sum Theorems connected with the Series  $\sum x^n/n^2$ : Prof. L. J. Rogers.—On Sommerfeld's

Diffraction Problem and on Reflection by a Parabolic Mirror: Prof. H. Lamb.

## FRIDAY, MARCH 9.

ROYAL INSTITUTION, at 9.—Some Dietetic Problems: Dr. R. Hutchison.

PHYSICAL SOCIETY, at 8.

MALACOLOGICAL SOCIETY, at 8.—Descriptions of twenty-seven Marine Gastropoda, and one Scaphopod, from the Persian Gulf and Gulf of Oman: J. C. Melvill.—Note on *Capulus lissus*, Smith: J. C. Melvill.—Mollusca from a Rainwash, 150 ft. O.D. at Hariton: Rev. R. Ashington Bullen.—Report on a Small Collection of Land and Freshwater Shells from Uganda, with Descriptions of two New Species of Limicolaria and one of Martensia: H. B. Preston.—On New Species of Polyplacophora from South Australia: W. T. Bednall and E. H. V. Matthews.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Design of a Two-hinged Spandrel-Braced Steel Arch: R. Freeman.

## SATURDAY, MARCH 10.

ROYAL INSTITUTION, at 3.—The Corpuscular Theory of Matter: Prof. J. J. Thomson, F.R.S.

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